REMARKS

The amendments to the specification and claims place this application in better condition for allowance. The amendments are not made to distinguish prior art or for other patentability purposes.

Attached hereto is a marked-up version of the changes made to the specification and claim(s) by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

The paragraph beginning at page 3, line 13:

As described above, several different methods are being used to clean components of generator stator and rotor. Containing, removing and disposing of the used glass beads and corn cob[,] processes related to collecting and disposing of the contaminated rags after cleaning pose an environmental hazard. Workmen are exposed to hazardous chemical cleaners and are subjected to potential exposure to airborne contamination of the media used for blast cleaning. The blast cleaning media can escape from the enclosure and contaminate the surrounding area. Thus, there is a need to overcome the problems faced by prior approaches.

The paragraph beginning at page 3, line 25:

These methods of cleaning are very labor intensive and generates considerable amount of waste material that has to be disposed of. Some of the cleaning solvents used [is] <u>are</u> classified as hazardous. Thus, there is a need to overcome the above-identified problems faced by traditional techniques.

The paragraph beginning at page 4, line 2:

Accordingly, the present invention provides a laser ablation method and apparatus to clean generator and turbine components overcoming problems faced by prior methods.

The laser ablation method of the present invention uses short pulses of a laser to cause very localized [deposit] deposits of energy causing surface deposits to vaporize and explode, and thereby releasing the contaminant deposits from the surface they are attached to. Contaminant vapors are then removed and filtered by a vacuum collection system. The laser ablation method of the present invention significantly reduces waste products due to the vaporization of contaminants during removal.

The paragraph beginning at page 5, line 20 through page 6, line 8:

In another aspect, a laser based system for removing contaminants deposited on a machine component surface, [comprising] comprises a laser source; a controller for controlling the laser source, the controller causing the laser to emit a laser beam such that the contaminants deposited on the machine component surface are ablated without changing base material properties of the machine component. The controller is preferably programmed to control the laser source. The system further includes a computer system coupled to the controller; a detector disposed adjacent the generator or turbine component to monitor the progress of laser ablation using the laser beam from the laser source, the detector providing the monitored data to the computer system for causing the controller to vary the power of the laser beam from the laser source. The computer system preferably includes a processor having a comparator; and a database for storing turbine or generator component data, and respective laser power related data for causing laser ablation of surface contaminants and coatings of the turbine or generator components.

The paragraph beginning at page 6, line 9:

In another aspect, a laser-based system for cleaning a generator or turbine component, [comprising] comprises a controller coupled to a laser source for controlling the laser source to perform laser ablation; means for directing a laser beam at a generator or turbine component surface for vaporizing surface contaminants and coatings deposited on the generator or turbine component surface without changing base material properties of the generator or turbine component. The system also includes a computer system having a processor and a database, the computer system communicatively coupled to the controller, and wherein the database is loaded with turbine or generator component data and corresponding laser power related data for ablating surface contaminants and coatings from the turbine or generator components; a detector disposed adjacent to the turbine or generator component to monitor ablation process and provide feedback data to the computer system; a comparator for comparing the feedback data with predetermined data to determine progress of ablation; and means for controlling the laser source depending on the comparison step.

The paragraph beginning at page 8, line 2:

FIGURE 1 is a schematic of a system for cleaning machine components using laser ablation technique in accordance with an [example] exemplary embodiment of the present invention;

The paragraph beginning at page 8, line 6:

FIGURE 2 illustrates another embodiment of the present invention [as shown in FIGURE 1];

The paragraph beginning at page 8, line 8:

FIGURE 3 illustrates a high level process flow chart for cleaning machine components using laser ablation method in accordance with an [example] exemplary embodiment of the present invention;

The paragraph beginning at page 8, line 12:

FIGURE 4 is a detailed flow-chart illustrating the process steps involved [in the laser ablation process] when using the system [as] shown in Figure 1.

The paragraph beginning at page 10, line 10:

In operation, as illustrated in Figure 3, a laser beam from the laser source is directed at the surface of a machine component. The laser beam is preferably directed using a laser gun. In the first embodiment as in Figure 1, the controller 14 is programmed with known laser power data to control the laser source to ablate and evaporate surface contaminants and surface coating(s) of component 18 without causing any changes in material properties of the base material. The surface material to be removed is heated so rapidly by the laser beam that the surface material is caused to vaporize. The laser ablation process preferably uses short laser pulses to cause very localized [deposit]

deposits of energy by exciting molecular bonds. The deposition of localized energy causes surface deposits to vaporize and explode, releasing the deposits from the surface to which they are attached. The vapors are then removed and filtered preferably by a vacuum collection system 26, 126.

IN THE CLAIMS

1. (Amended) A method of cleaning a [generator or turbine] machine [components] component using a laser beam, the method comprising:

programming a controller coupled to a laser source for controlling the laser source of the laser beam to perform laser ablation; and

directing [a] the laser beam , at [a generator or turbine] the machine component surface for vaporizing surface contaminants and coatings deposited on said [generator or turbine component] surface without changing base material properties of said [generator or turbine] machine [components] component.

2. (Amended) The method of claim 1, further comprising:

coupling the controller to a computer system having a processor and a database;

loading the database with [turbine or generator] machine component data and corresponding laser power related data for ablating surface contaminants [and] or coatings from the [generator or turbine components] surface;

providing a detector to monitor the ablation [process] of surface contaminants or coatings, and provide feedback data to the computer system;

comparing the feedback data with predetermined data to determine progress of ablation; and

controlling the laser source depending on the comparison step.

6. (Amended) The system as in claim 4, further comprising:

a computer system coupled to the controller; and

a detector disposed adjacent the [generator or turbine] machine component to monitor the progress of laser ablation [using the laser beam from the laser source], the detector providing data of the monitored [data] progress to the computer system for causing the controller to vary the power of the laser beam from the laser source.

7. (Amended) The system as in claim 6, where the computer system comprises:

a processor having a comparator; and

a database for storing [turbine or generator] machine component data, and respective laser power related data for causing laser ablation of the surface contaminants [and coatings of the turbine or generator components].

8. (Amended) A laser-based system for cleaning a [generator or turbine] machine component, comprising:

a controller coupled to a laser source for controlling the laser source to perform laser ablation;

means for directing a laser beam at [a generator or turbine component] a surface of the machine component for vaporizing surface contaminants [and] or coatings deposited on said [generator or turbine component] surface without changing base material properties of said [generator or turbine components] component;

a computer system having a processor and a database, the computer system communicatively coupled to the controller, and wherein the database is loaded with

[turbine or generator] machine component data and corresponding laser power related data for ablating surface contaminants [and] or coatings from the [turbine or generator components] component;

a detector disposed adjacent to the [turbine or generator] component to monitor [ablation process] progress of vaporization of the surface contaminants or coatings, and provide feedback data to the computer system;

a comparator for comparing the feedback data with predetermined data to determine progress of [ablation] vaporization; and

means for controlling the laser source depending on the comparison step.

9. (Amended) A laser-based method for cleaning a machine component, the method comprising:

controlling a laser source to [modulate] apply a laser beam for performing laser ablation;

directing the laser beam towards a component surface for vaporizing surface contaminants [and] or coatings deposited on the component surface without changing base material properties of the component;

communicatively coupling a computer system having a processor and a database to the controller;

loading the database with data related to the component and corresponding laser power related data for ablating contaminants and coatings from respective components;

monitoring ablation process of the component using a detector, the detector being disposed adjacent to the component;

receiving feedback data from the detector at the computer system;

comparing the feedback data with predetermined data in a comparator to determine progress of ablation; and

controlling the laser source depending on the comparison step.

10. (Amended) An apparatus for cleaning a generator or turbine components using a laser beam, comprising:

means for controlling a laser source to perform laser ablation; and

means for directing a laser beam at a generator or turbine component surface for vaporizing surface contaminants [and] or coatings deposited on said generator or turbine component surface without changing base material properties of said generator or turbine components.

11. (Amended) The apparatus as in claim 10, further comprising:

a controller communicatively coupled to a computer system having a processor and a database ;

means for loading the database with turbine or generator component data and corresponding laser power related data for ablating surface contaminants [and] or coatings from the generator or turbine components;

means for monitoring ablation process and providing feedback data to the computer system;

means for comparing the feedback data with predetermined data to determine progress of ablation; and

means for controlling the laser source depending on the comparison step.